

Influence of the base and diluent monomer on network characteristics and mechanical properties of neat resin and composite materials

Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20427962&lokasi=lokal>

Abstrak

This study evaluated the effect of the combination of two dimethacrylate-based monomers [bisphenol A diglycidyl dimethacrylate (BisGMA) or bisphenol A ethoxylated dimethacrylate (BisEMA)] with diluents either derived from ethylene glycol dimethacrylate (ethylene glycol dimethacrylate, diethylene glycol dimethacrylate, triethylene glycol dimethacrylate, tetraethylene glycol dimethacrylate) or 1,10-decanediol dimethacrylate (D3MA) on network characteristics and mechanical properties of neat resin and composite materials. The degree of conversion, maximum rate of polymerization and water sorption/solubility of unfilled resins and the flexural strength and microhardness of composites (after 24 h storage in water and 3 months storage in a 75 vol% ethanol aqueous solution) were evaluated. Data were analyzed with two-way ANOVA and Tukey's test ($\alpha = 0.05$). The higher conversion and lower water sorption presented by BisEMA co-polymers resulted in greater resistance to degradation in ethanol compared with BisGMA-based materials. In general, conversion and mechanical properties were optimized with the use of long-chain dimethacrylate derivatives of ethylene glycol. D3MA rendered more hydrophobic materials, but with relatively low conversion and mechanical properties.